

What is claimed is:

1. An ATM cell service apparatus which accommodates an ATM cell in an optical synchronous communications network through an N.A. (North America) asynchronous communications network, comprising:
- an optical synchronous communications network signal terminating unit terminating a signal in an optical synchronous communications network;
- an N.A. asynchronous communications network signal terminating unit terminating a signal in an N.A. asynchronous communications network;
- an ATM cell extraction unit extracting an ATM cell from a signal of the optical synchronous communications network or a signal of the N.A. asynchronous communications network;
- an ATM cell mapping unit mapping an ATM cell extracted by said ATM cell extraction unit in a signal of the N.A. asynchronous communications network or the optical synchronous communications network; and
- a signal transmission unit transmitting a signal of the N.A. asynchronous communications network in which the ATM cell is mapped, or a

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signal of the optical synchronous communications network in which the ATM cell is mapped.

2. The apparatus according to claim 1, further
5 comprising:

an optical synchronous communications network interface unit connecting a signal for an optical synchronous communications network to an optical synchronous communications network; and

10 an ATM network interface unit directly connecting a signal for an optical synchronous communications network to an ATM network.

3. The apparatus according to claim 2, further
15 comprising

at least said optical synchronous communications network signal terminating unit commonly to said optical synchronous communications network interface unit and an ATM network interface
20 unit so that an amount of hardware of said ATM cell service apparatus can be reduced.

4. The apparatus according to claim 1, wherein
said ATM cell extraction unit comprises:

25 a first unit extracting an ATM cell from

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a signal obtained by directly mapping an ATM cell in an N.A. asynchronous communications network signal; and

5 a second unit extracting an ATM cell from a signal obtained by mapping an ATM cell in a predetermined format in the N.A. asynchronous communications network signal, wherein

10 an amount of hardware can be reduced by sharing a part of the hardware of said first and second units.

5. The apparatus according to claim 4, wherein said predetermined format is a PLCP.

15 6. The apparatus according to claim 1, wherein when an ATM cell input from an optical synchronous communications network or an N.A. asynchronous communications network is faulty, said signal transmission unit generates an ATM cell
20 exclusively informing that a fault has occurred, and transmits the generated ATM cell.

25 ~~7.~~ A method of providing an ATM cell service in which an ATM cell is accommodated in an optical synchronous communications network through an N.A.

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asynchronous communications network, comprising:

(a) terminating a signal in an optical synchronous communications network;

(b) terminating a signal in an N.A. asynchronous communications network;

(c) extracting an ATM cell from a signal of the optical synchronous communications network or a signal of the N.A. asynchronous communications network;

(d) mapping an ATM cell extracted in step (c) in a signal of the N.A. asynchronous communications network or the optical synchronous communications network; and

(e) transmitting a signal of the N.A. asynchronous communications network in which the ATM cell is mapped, or a signal of the optical synchronous communications network in which the ATM cell is mapped.

8. The method according to claim 7, further comprising:

(f) connecting a signal for an optical synchronous communications network to an optical synchronous communications network; and

(g) directly connecting a signal for an

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optical synchronous communications network to an ATM network.

9. The method according to claim 7, wherein

5 said step (c) comprises:

(h) extracting an ATM cell from a signal obtained by directly mapping an ATM cell in an N.A. asynchronous communications network signal; and

10 (i) extracting an ATM cell from a signal obtained by mapping an ATM cell in a predetermined format in the N.A. asynchronous communications network signal.

15 10. The method according to claim 7, wherein

when an ATM cell input from an optical synchronous communications network or an N.A. asynchronous communications network is faulty, an ATM cell exclusively informing that a fault has
20 occurred is generated, and the generated ATM cell is transmitted in said step (e).

~~11.~~ An ATM cell service apparatus which accommodates an ATM cell for synchronous and
25 asynchronous communications networks, comprising:

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a detection unit detecting an out of frame state, a loss of a signal, or a signal fault; and

a cell insertion unit mapping an IDLE cell or an Unassigned cell in a synchronous frame upon
5 receipt of a detection result from said detection unit.

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